



***Mycobacterium tuberculosis* Genotyping**

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Tuberculosis Epidemiologist

Mycobacterium tuberculosis (TB) bacteria are transmitted through airborne particles known as droplet nuclei. Depending on the frequency, duration, and environment of exposure, a person can become infected with TB. A person that is infected with TB but does not have disease is known to have latent TB infection (LTBI). Once a person has contracted LTBI, the risk for progression to disease varies. The greatest risk for progression to disease occurs within the first two years after infection, when approximately half of the 5-10 percent lifetime risk occurs (1). HIV infection is the greatest risk factor for progression to disease. Other high-risk factors include LTBI in infancy or early childhood, diabetes mellitus, apical fibronodular changes on chest radiograph, and therapeutic agents for treating autoimmune-related conditions. Since disease may take years to develop, sometimes it is difficult to determine where transmission took place and if the transmission has stopped.

In 2004, the National Tuberculosis Controllers Association (NTCA), along with the Centers for Disease Control and Prevention (CDC) Advisory Group on Tuberculosis Genotyping, published the *Guide to the Application of Genotyping to Tuberculosis Prevention and Control* (2). The CDC has contracted with laboratories in California and Michigan to perform the genotyping (DNA analysis). TB control programs in 50 states and two large cities (New York and San Diego) participate in this program (3). All initial culture positive isolates of TB are sent to the program laboratories for genotyping. These data will help TB control programs identify recent transmission of TB, detect outbreaks sooner, identify false-positive *M. tuberculosis* cultures, and evaluate completeness of contact investigations.

The genotyping laboratories will use three methods: spoligotyping, mycobacterial interspersed repetitive units (MIRU) analysis, and IS6110-based restriction fragment length polymorphism (RFLP) analysis (2). Spoligotyping and MIRU analysis are based on the polymerase chain

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reaction (PCR). RFLP will be performed only if requested. All isolates will be given a PCR type. If two PCR types match within a state, they will be given a state genotype cluster number.

Epidemiologic data, along with genotyping results, aid in contact investigations. Two patients in the same city may present with TB in the same time frame but have non-matching genotypes; it can be assumed that they were not involved in the same chain of recent transmission. Patients who belong to the same genotype cluster and share known epidemiologic links are said to belong to an epidemiologically confirmed genotype cluster. Two patients who have matching genotypes and share possible epidemiologic links will have to be re-evaluated to determine if they are involved in the same chain of recent transmission.

When the Indiana TB Control Program receives genotype results, this information is shared with the local public health nurse. If the TB Control Program is concerned about a genotype cluster or a genotype cluster has several recently new cases in the state, a conference call will be held with the TB Control Program and the counties involved to examine epidemiologic links. This involves re-interviewing the patient, re-evaluating contacts, and re-evaluating sites where transmission occurred. A major concern is high-risk congregate settings, which include health-care facilities, correctional facilities, homeless shelters, and bars. Also flagged are high-risk populations, e.g., HIV-infected persons, foreign-born, young children, and drug and excessive alcohol users who are contacts of the TB patient (1). Public health nurses and staff who have the best rapport with the patient and contacts should conduct these re-interviews, since a level of trust is needed to obtain sensitive information. The genotyping cluster information is very helpful at the state and national levels, as it helps build epidemiologic links that might not have been previously detected, especially with the mobility of patients in today's world.

An estimated 1-3 percent of all reported cases of TB have an incorrect diagnosis for TB (2). Incorrect diagnosis can result from laboratory cross-contamination, mislabeling of patient specimens, collection errors, and reporting errors. If a patient presents with no signs or symptoms, negative chest radiograph, and improves with non-tuberculosis medications, the diagnosis should be re-evaluated. The patient might have only one specimen identified as TB positive, whereas all other specimens are negative. Genotyping may show a control strain used in the laboratory, or the specimen may have been processed near another specimen that had high numbers of TB bacillus in the sample.

What is in the pipeline for the TB Genotyping Program? Lauren Cowan (L. Cowan, personal communication, November 5, 2007) from the CDC reports that:

- a genotyping Web-based program will enable state TB control programs to access PCR information and manage their genotype data,
- the Report of Verified Case of Tuberculosis (RVCT) will add PCR-type information to the report,
- 12 more loci will be added to the MIRU analysis, which will make the test more sensitive.

The Tuberculosis Genotyping Program has improved the contact investigation of TB patients. Collaboration with the public health staff who continually interview patients for more clues in transmission has been very beneficial. The additional information enables the program to prioritize high-risk groups and populations and to find previously unknown places where transmission has occurred to facilitate locating new cases and contacts.

References

1. CDC. Controlling Tuberculosis in the United States, MMWR 2005; 54(No.RR-12):1-14.
2. National TB Controllers Association/CDC Advisory Group on Tuberculosis Genotyping. Guide to the Application of Genotyping to Tuberculosis Prevention and Control. Atlanta, GA: US Department of Health and Human Services, CDC; June 2004.
3. New CDC Program for Rapid Genotyping of *Mycobacterium tuberculosis* Isolates. JAMA 2005; 293:2086.

Tipton County Health Department Conducts Mass Prophylaxis Exercise Using Flu Vaccine Clinic

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On October 3, the Tipton County Health Department (TCHD) conducted its second mass prophylaxis exercise of 2007. Volunteers were trained in their respective point of dispensing (POD) roles, and the POD layout and Mass Prophylaxis Plan were revised using the information learned.

To make the exercise more realistic, free flu shots and \$25 pneumonia shots were offered in order to attract large numbers of the public. As people arrived, they went through the exercise (a mock anthrax event). After they had received their “medication” at the dispensing station, they could “cash” it in for a free flu shot. The flu clinic operated as a separate function to avoid disturbing throughput for the mass prophylaxis exercise. Tipton County Hospital nurses served as flu vaccinators so that TCHD clinic volunteers could focus on the POD training.

The goal of the exercise was to distribute 400 flu shots in a two-hour period (5-7:00 p.m.). During that time, 415 people went through the exercise, and 405 received flu shots. Six vaccinators were used from 5:00 to 5:30 p.m. When the line for flu shots began to interfere with the mass prophylaxis exercise, three volunteers were reassigned to serve as vaccinators, totaling nine vaccinators from 5:30 to 7:00 p.m.

Throughput:

5:00 – 5:30 p.m. – 1.7 people per minute with six vaccinators
5:30 – 6:00 p.m. – 5.4 people per minute with nine vaccinators
6:00 – 6:30 p.m. – 3.2 people per minute with nine vaccinators
6:30 – 7:00 p.m. – 3.2 people per minute with nine vaccinators

Total Average – 3.6 people per minute

Variables:

- Because individuals had to first pass through the mass prophylaxis exercise and complete paperwork before receiving a flu shot, no flu shots were given from 5:00 to 5:15.
- Some individuals chose to receive a \$25 pneumonia shot as well, which required vaccinators to give two vaccinations instead of one.
- Actual times may vary up to five minutes, since they were recorded upon communication by the Inventory Manager to the Operations Section Chief and then to the Incident Commander where they were officially recorded.

All individuals received vaccine information statements regarding flu vaccination and/or pneumonia vaccination, depending on what they received. The inventory was managed by counting the vaccination consent forms, which the vaccinators collected as they vaccinated individuals. This inventory system was separate from the system used during the mass prophylaxis exercise but equally as important. Since the flow of “patients” was steady, it was necessary to maintain the flu vaccine inventory as accurately as possible, so an average of clinic throughput could be estimated to determine when (and if) vaccine supplies were depleted. If vaccine supplies were depleted, exercise organizers planned to ask local emergency management agency representatives to inform residents that, although flu vaccine was no longer available, they could still participate in the exercise.

Henry County Health Department Mass Prophylaxis Exercise Uses Drive-through Clinic

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Henry County Health Department

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On October 2, the Henry County Health Department (HCHD) exercised its mass prophylaxis plan using an inventive drive-through clinic. Clinic volunteer staff distributed M&M's® candy “medications” and informational packets to each participant that came through the drive-through line. People were encouraged to participate as many times as they wanted to help ensure the exercise would have a good volume of traffic flow. Participants were allowed to pick up “medications” for up to eight family members per vehicle.

Throughput data

Total number of participant forms: 230

Total number of individuals served: 596

Estimated total number of vehicles through the exercise: 210-225

Participant demographics: Average Age: 46.6 years

Breakdown by 10-year intervals:

Age	Number of individuals
16-19	11
20-29	20
30-39	39
40-49	55
50-59	41
60-69	34
70-79	9
80-91	5

Gender of person completing form:

Male	89
Female	141

Individuals served per form: Average = 2.6

(25 cars were assessed randomly)

Breakdown by number of individuals per form:

Number per Form	Form Count
1	57
2	73
3	40
4	45
5	8
6	5
7	1
8	1
9	0
10	1

Throughput Time

Average Time from Station #1 to

Station #3: 5.56 Minutes

Breakdown in nearest one-minute intervals:

Minutes	Numbers	Percentage
12	1	4%
8	2	8%
7	3	12%
6	3	12%
5	9	36%
4	6	24%
3	1	4%

Throughput Time (compared to persons per form):

Persons per Form	Minutes (average)
1	4.3
2	6.2
3	5.3
4	5.3
10	12.0

Residency of Participants:

New Castle	198
Henry County	225
Out of County	5

Form Completion:

Filled out correctly and completely	191 (83%)
Not complete or incorrect	39 (17%)

General Observations

The age and gender numbers generally reflected the individuals who were more available to participate from 2-5 p.m. and are more skewed to older and female participants than to the general population. Many city employees participated, since the Mayor authorized them to go through during working hours. There were no overly busy intervals noted at any time. Although the exercise had been promoted directly to all the high schools in the county hoping to attract

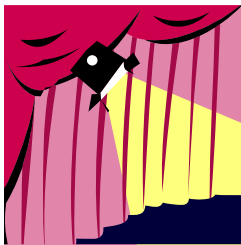
those young drivers when they left school, a smaller group of teenage drivers participated than was expected.

The number of individuals served per form is greatly skewed toward the low end due to some obvious factors. First, people did not really plan to pick up medications for extended family, friends, or neighbors because they were not prompted or instructed to do so ahead of time. In a real situation, that would occur more frequently. Also, for various reasons, the child-rearing age groups were not well represented in the exercise participants.

The throughput time for participants is a good estimate for what would really be needed for this type of medication distribution, and most vehicles could go through the stations in 4-6 minutes, with an actual throughput time of 30 seconds or less. If all three drive-through dispensing sites plus the one walk-through dispensing site were used, the HCHD would be able to dispense medication to the entire county population of 48,000 within the 48-hour guideline.

HCHD is willing to share the traffic flow for the drive-through clinic. Please contact Gary Maitlen, local public health coordinator, at lphchenry@isdh.in.gov or 765.686.1101.

Correction: In the October (2007) newsletter, the Outbreak Spotlight article stated that, “Two secondary cases were also identified among the groups of patrons.” The sentence should have read, “One secondary case was also identified among the groups of patrons.” The graph correctly illustrated the number of secondary cases.



OUTBREAK SPOTLIGHT....

Outbreak Spotlight is a recurring feature in the Indiana Epidemiology Newsletter to illustrate the importance of various aspects of an outbreak investigation. The event described below highlights an investigation of a gastroenteritis outbreak originating on a riverboat.

Rollin' On the River

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Historically, the Ohio River has served as a primary transportation route for settlers and commerce, as farmers and manufacturers sent goods and crops on flatboats and barges downstream to the Mississippi River and eventually on to New Orleans. Today, the Ohio River continues to serve as a major artery for transporting bulk items such as coal and grain. However, the transport of people diminished with the arrival of railroads, improved highways, and air travel. Passenger transport along the river today is largely recreational aboard paddlewheel steamships.

Marketing directors and visitor bureaus are trying to entice the ships to stop at their docks so the passengers can take arranged tours or side trips to benefit local businesses and attractions. River communities might consider the possibility of the passenger-laden boats bringing something with them other than the urge to shop. The city of Evansville and the Vanderburgh County Health Department learned this lesson when they received surprise guests in October 2006.

The Vanderburgh County Experience

On October 20, 2006, news media reported that a riverboat had made an unscheduled stop in Owensboro, Kentucky, to send ill passengers to the hospital. The vessel continued on to its planned docking in Henderson, Kentucky, later that same evening, where additional sick passengers were transported to the local hospital. Henderson is served by the Green River District (KY) Health Department, and an epidemiologist and environmental director boarded the boat on Friday evening and accompanied passengers from Henderson to Paducah.

On October 22, 2006, a Vanderburgh County Health Department (VCHD) environmental health specialist notified the communicable disease director that, on October 21, approximately 150 passengers and crew of the affected riverboat were taken to an Evansville area hotel. The local fire department contacted the VCHD due to the increased requests for ambulance transport. Passengers who disembarked at Henderson included those in the same travel party as persons who had been hospitalized and anyone else who voluntarily wanted to end the cruise. After arrival at the hotel, some people became ill with vomiting and diarrhea.

The communicable disease director notified the health officer, the executive director, the ISDH district field epidemiologist, and the Indiana State Department of Health (ISDH) duty officer. The VCHD decision team met that afternoon and contacted Kentucky health officials and the Centers for Disease Control and Prevention (CDC). (The CDC had been unaware that riverboat passengers disembarking in Indiana had become ill.)

A team of four staff members from the VCHD and the ISDH district field epidemiologist arrived at the hotel with go-kits that included appropriate personal protective equipment (PPE) and needed materials. Since communication difficulties prevented using the CDC questionnaire, the team used a generic gastrointestinal survey tool. This decision proved good, as several guests went home the following morning, and the opportunity to interview them would have been lost.

Hotel staff gave the response team a printout of the roster of riverboat guests staying at the hotel. Four response team members went door-to-door to interview passengers and collect a stool sample if the individual was currently having diarrhea. Forty questionnaires were completed and forwarded to the CDC. The other member of the response team inspected the food service area and closed the pool. The ISDH Laboratories analyzed the stool specimens, which tested positive for norovirus by PCR. Through combined efforts, Indiana health officials were first to confirm the outbreak agent.

Control measures at the hotel included:

- Self-isolation of sick or recovering passengers or crew to their hotel rooms (the hotel had already issued a written request to do this and encouraged use of room service)
- Using disposable plates and eating utensils for room service and keeping trays in rooms
- Providing plastic bags for soiled laundry and calling for immediate pick-up of laundry and room-service trays

- Closing and superchlorinating the pool and hot tub and draining and disinfecting ice machines
- Frequently disinfecting commonly touched surfaces throughout the hotel
- Terminally cleaning the rooms of sick guests after checkout and leaving rooms vacant as long as possible
- Excluding ill staff from work until 72 hours after symptoms stopped
- Encouraging everyone to wash hands frequently with soap and water for at least 20 seconds

The VCHD conducted active surveillance by contacting hotel staff daily, Monday through Friday, for nearly three weeks (72 hours after cessation of symptoms in last reported case).

On October 26, VCHD staff met with the Vanderburgh County Emergency Management Agency (EMA), the hotel manager, and EMA and EMS officials from Henderson, Kentucky. The incident commander on the scene Friday evening when the riverboat first docked in Henderson reported that the captain and the cruise director would not follow some precautions and that the information coming from the boat was not consistent with information in the command center. It was unclear who had authority at the scene and whether that differed when the ship was on the river or when it was docked. The hotel manager reported no prior knowledge of the arrival of riverboat passengers. They came by bus to the hotel on October 21. According to the hotel manager, the cruise company decided to lodge the disembarked passengers in Evansville to facilitate flights out of the Evansville airport.

Vanderburgh County health officials responded within the target timeframe from the time they became aware of the public health threat. However, they were notified 24 hours after the threat arrived. The major points for improvement described in the after-action report included:

- Lack of awareness of the Kentucky hospital and health department to notify Vanderburgh County health officials of transfer of persons exposed to an outbreak
- Lack of awareness of an Indiana hospital to notify the VCHD of a request from a hotel to triage sick guests
- Limited knowledge or lack of awareness at hospitals and in the hospitality industry of large-scale gastrointestinal outbreak control measures

These weaknesses were corrected by establishing an after-hours notification system (which was already under way), adding contact numbers for neighboring state and local agencies to the communication plan, and clarifying control measures and communication methods with central dispatch, hospitals, emergency response agencies, transportation agencies, hotels, cleaning companies and public health agencies of all five states involved in the outbreak (see below). Although no media arrived at the hotel while the response team was conducting interviews, it would have been beneficial to have a designated public information officer on site.

The Multi-state Outbreak

The incident involving passengers who stayed at a Vanderburgh County hotel was actually part of a larger norovirus outbreak that extended across multiple cruises of the same riverboat.

The CDC Vessel Sanitation Program investigates international cruise ship outbreaks when 3 percent of the passengers become ill. Ships without an international itinerary, such as domestic riverboats, fall under the authority of the Food and Drug Administration (FDA). Officially, the level of illness did not exceed 3 percent before the cruise left on October 18. This 7-day cruise

originated in Pittsburgh with dockings scheduled in Cincinnati, Ohio; Louisville, Henderson, and Paducah, Kentucky; and Cape Girardeau, St. Louis, and Hannibal, Missouri.

On October 19, the CDC received a report from a passenger onboard the ship from October 14-18 who stated that passengers and crew members were ill. The next day, the riverboat company reported 30 passengers were ill, which exceeded 5 percent of the passengers. A CDC team, led by Dr. Anadi Sheth, met the riverboat in Paducah on October 22. The CDC team found that the vessel had two dining areas, three public bathrooms, a pool (which was closed), and no clinic or health care providers onboard. The crew had separate living and dining quarters. Many passengers were elderly, there was opportunity for frequent contact, and isolating ill passengers was difficult. Public restrooms were closed. Hand sanitizer was available at the front desk, dining area, elevators, and along handrails. Since the FDA inspection showed no violations, the ship was allowed to continue its journey. Illnesses continued, so there was an early termination of the cruise in Cape Girardeau, Missouri. Ill passengers were either hospitalized or sent to hotels, and well passengers were bused to St. Louis for lodging. An action plan was prepared for the next cruise. The crew docked the riverboat at St. Louis, where it was cleaned and inspected by the FDA. Passengers embarking were given an educational presentation about the illness. A nurse and FDA representatives were onboard when the boat left on October 24. Again, reports of ill passengers and crew surfaced, and the CDC team met the ship in Hannibal. The FDA issued a stop-sail order, all non-essential crew members were removed, and the next cruise was canceled. A new action plan was developed, and no illness was reported on the subsequent cruise.

Seventeen passengers from three consecutive cruises tested positive for the same strain of norovirus, a new variant known as GII.4. According to the CDC, during the cruise with passengers diverted to Vanderburgh County, 52 percent of the passengers and 18 percent of the crew members became ill (43% of total ship population). According to Dr. Sheth, secondary cases were noted in 9 hotel employees, 5 public health responders, 2 health care workers, 3 cruise company employees, and 2 other individuals. No secondary cases arose among the VCHD or ISDH district staff.

Conclusions

Several conclusions were made during the investigation. The source of the initial infection was unknown. Infection was most likely transmitted person to person, and several secondary cases were identified. Transmission continued despite cleaning and isolation measures, demonstrating the environmental hardiness of norovirus (see below). Guidelines, similar to those for ocean-going vessels, are needed for outbreak reporting and control on domestic ships.

Norovirus

Norovirus is the most common cause of acute infectious gastroenteritis. Studies show that common settings for norovirus outbreaks include restaurants and catered meals (36%), long-term care facilities (23%), schools (13%), and vacation settings or cruise ships (10%). Person-to-person transmission among closed populations is common. The incubation period is usually between 24 and 48 hours, and symptoms, which generally last 24 to 60 hours, include sudden onset of vomiting, watery non-bloody diarrhea, abdominal cramps, and nausea. Recovery is usually complete but there is a risk of dehydration. Noroviruses are highly contagious, and as few as 10 viral particles may be sufficient to cause infection. Noroviruses are transmitted primarily through the fecal-oral route, either by consumption of fecally contaminated food or

water or by direct person-to-person contact. Environmental and fomite contamination may also serve as a source of infection. Several modes of transmission may occur during outbreaks.

Health Department Recognition

On May 18, 2007, the FDA Office of Regulatory Affairs awarded the Group Recognition Cross-Cutting Award to a group of 53 federal, state, and local health officials, including Denise Cory of the Vanderburgh County Health Department, for their successful coordination during outbreak investigation. Agencies recognized included the CDC, Coast Guard, FDA, and the state health departments of Illinois, Indiana, Kentucky, Missouri, and Ohio.

Denise Cory, Director of Communicable Disease Control, Vanderburgh County Health Department, provided background information and a summary of the VCHD after-action report.



Training Room

INDIANA STATE DEPARTMENT OF HEALTH IMMUNIZATION PROGRAM PRESENTS:

Immunizations from A to Z

Immunization Health Educators offer this FREE, one-day educational course that includes:

- Principles of Vaccination
- Childhood and Adolescent Vaccine-Preventable Diseases
- Adult Immunizations
 - Pandemic Influenza
- General Recommendations on Immunization
 - Timing and Spacing
 - Indiana Immunization Requirements
 - Administration Recommendations
 - Contraindications and Precautions to Vaccination
- Safe and Effective Vaccine Administration
- Vaccine Storage and Handling
- Vaccine Misconceptions
- Reliable Resources

This course is designed for all immunization providers and staff. Training manual, materials, and certificate of attendance are provided to all attendees. Please see the Training Calendar for presentations throughout Indiana. Registration is required. To attend, schedule/host a course in your area or for more information, please reference <http://www.IN.gov/isdh/programs/immunization.htm>.

ISDH Data Reports Available

The following data reports and the *Indiana Epidemiology Newsletter* are available on the ISDH Web Page:

http://www.IN.gov/isdh/dataandstats/data_and_statistics.htm

HIV/STD Quarterly Reports (1998-June 2006)	Indiana Mortality Report (1999, 2000, 2001, 2002, 2003, 2004, 2005)
Indiana Cancer Incidence Report (1990, 1995, 1996, 1997, 1998)	Indiana Infant Mortality Report (1999, 2002, 1990-2003)
Indiana Cancer Mortality Report (1990-1994, 1992-1996)	Indiana Natality Report (1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005)
Combined Cancer Mortality and Incidence in Indiana Report (1999, 2000, 2001, 2002, 2003, 2004)	Indiana Induced Termination of Pregnancy Report (1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005)
Indiana Health Behavior Risk Factors (1999, 2000, 2001, 2002, 2003, 2004, 2005)	Indiana Marriage Report (1995, 1997, 1998, 1999, 2000, 2001, 2002)
Indiana Health Behavior Risk Factors (BRFSS) Newsletter (9/2003, 10/2003, 6/2004, 9/2004, 4/2005, 7/2005, 12/2005, 1/2006, 8/2006, 10/2006, 5/2007)	Indiana Infectious Disease Report (1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005)
Indiana Hospital Consumer Guide (1996)	Indiana Maternal & Child Health Outcomes & Performance Measures (1990-1999, 1991-2000, 1992-2001, 1993-2002, 1994-2003, 1995-2004)
Public Hospital Discharge Data (1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006)	

HIV Disease Summary

Information as of October 31, 2007 (based on 2000 population of 6,080,485)

HIV - without AIDS to date:

399	New HIV cases from November 2006 thru October 31, 2007	12-month incidence	6.93 cases/100,000
3,804	Total HIV-positive, alive and without AIDS on October 31, 2007	Point prevalence	66.13 cases/100,000

AIDS cases to date:

340	New AIDS cases from November 2006 thru October 31, 2007	12-month incidence	5.91 cases/100,000
4,086	Total AIDS cases, alive on October 31, 2007	Point prevalence	71.04 cases/100,000
8,405	Total AIDS cases, cumulative (alive and dead) on October 31, 2007		

REPORTED CASES of selected notifiable diseases

Disease	Cases Reported in October MMWR Weeks 40-43		Cumulative Cases Reported January – October MMWR Weeks 1-43	
	2006	2007	2006	2007
Campylobacteriosis	48	33	455	398
Chlamydia	1,514	1,619	16,425	17,228
Cryptosporidiosis	21	16	85	88
Cyclosporiasis	0	0	1	2
<i>E. coli</i> O157:H7	10	26	77	85
<i>Haemophilus influenzae</i>	2	4	65	49
Hepatitis A	4	7	23	29
Hepatitis B	5	5	46	46
Gonorrhea	675	717	7,309	7,413
Legionellosis	6	2	40	47
Listeriosis	3	2	15	16
Lyme Disease	1	1	21	41
Measles	0	0	1	0
Meningococcal, invasive	1	4	21	24
Mumps	0	0	10	1
Pertussis	8	5	184	52
Rocky Mountain Spotted Fever	0	0	6	4
Salmonellosis	72	72	756	612
Shigellosis	11	26	126	107
<i>Streptococcus pneumoniae</i> (invasive, all ages)	30	42	469	454
<i>Streptococcus pneumoniae</i> (invasive, drug resistant)	8	17	126	142
<i>Streptococcus pneumoniae</i> (invasive, <5 years of age)	3	5	49	38
Syphilis (Primary and Secondary)	10	6	77	47

REPORTED CASES of selected notifiable diseases (cont.)

Disease	Cases Reported in October MMWR Weeks 40-43		Cumulative Cases Reported January – October MMWR Weeks 1-43	
	2006	2007	2006	2007
Tuberculosis	6	6	99	105
Yersiniosis	1	0	9	13
Animal Rabies	0	1 (bat)	11 (bats)	11 (bats)

For information on reporting of communicable diseases in Indiana, call the *Surveillance and Investigation* section of the *Public Health Preparedness and Emergency Response Division* at 317.233.7125.



The *Indiana Epidemiology Newsletter* is published monthly by the Indiana State Department of Health to provide epidemiologic information to Indiana health care professionals, public health officials, and communities.

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